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SEQUENCE LISTING

<110> Ponath, Paul D.
Ringler, Douglas J.
Jones, S. Tarran
Newman, Walter
Saldanha, Jose
Bendig, Mary M.

<120> Humanized Immunoglobulin Reactive with
alpha4beta7 Integrin

<130> 1855.1017-000

<140> 08/700,737

<141> 1996-08-15

<160> 67

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 494

<212> DNA

<213> Artificial Sequence

<220>

<223> Mouse consensus sequence

<221> unsure

<222> (450)...(450)

<223> n=A,T,G or C

<221> unsure

<222> (466)...(466)

<223> n=A,T,G or C

<221> unsure

<222> (467)...(467)

<223> n=A,T,G or C

<221> unsure

<222> (482)...(482)

<223> n=A,T,G or C

<221> unsure

<222> (483)...(483)

<223> n=A,T,G or C

<400> 1

ttackrgwmk	wcatgrratg	sasctrkrct	atyytcttct	tggtatcaac	agctacaagt	60
gtccactccc	aggtccaact	gcagcagcct	ggggctgagc	ttgtgaagcc	tgggacttca	120
gtgaagctgt	cctgcaaggg	ttatggctac	accttcacca	gctactggat	gcactgggtg	180
aagcagaggc	ctggacaagg	ccttgagtgg	atcggagaga	ttgatacttc	tgagagtaat	240
actaactaca	atcaaaaatt	caagggcaag	gccacattga	ctgtagacat	ttcctccagc	300
acagcctaca	tgcagctcag	cagcctgaca	tctgaggact	ctgcggtcta	ctattgtgca	360
agagggggtt	acgacggatg	ggactatgct	attgactact	ggggtcaagg	cacctcagtc	420
accgtctcct	cagccaaaac	gacaccrycn	csyktmtmyc	yysbdnnccc	ykggrwscytg	480

gnngaagctt ggga

<210> 2
 <211> 144
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Mouse consensus sequence

 <221> UNSURE
 <222> (2)...(6)
 <223> Xaa = Any Amino Acid

 <221> UNSURE
 <222> (8)...(8)
 <223> Xaa = Any Amino Acid

<400> 2
 Met Xaa Xaa Xaa Xaa Xaa Ile Xaa Phe Leu Val Ser Thr Ala Thr Ser
 1 5 10 15
 Val His Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys
 20 25 30
 Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe
 35 40 45
 Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu
 50 55 60
 Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn
 65 70 75 80
 Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser
 85 90 95
 Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val
 100 105 110
 Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp
 115 120 125
 Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ala Lys Thr Thr
 130 135 140

<210> 3
 <211> 428
 <212> DNA
 <213> Unknown

<220>
 <223> Mouse

<221> CDS
 <222> (18)...(428)

<400> 3
 ttacttgacg actcggg atg gga tgg agc tat atc atc ttc ttc ttg gta 50
 Met Gly Trp Ser Tyr Ile Ile Phe Phe Leu Val
 1 5 10

 tca aca gct aca agt gtc cac tcc cag gtc caa ctg cag cag cct ggg 98
 Ser Thr Ala Thr Ser Val His Ser Gln Val Gln Leu Gln Gln Pro Gly
 15 20 25

gct gag ctt gtg aag cct ggg act tca gtg aag ctg tcc tgc aag ggt 146
 Ala Glu Leu Val Lys Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly
 30 35 40

tat ggc tac acc ttc acc agc tac tgg atg cac tgg gtg aag cag agg 194
 Tyr Gly Tyr Thr Phe Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg
 45 50 55

cct gga caa ggc ctt gag tgg atc gga gag att gat cct tct gag agt 242
 Pro Gly Gln Gly Leu Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser
 60 65 70 75

aat act aac tac aat caa aaa ttc aag ggc aag gcc aca ttg act gta 290
 Asn Thr Asn Tyr Asn Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val
 80 85 90

gac att tcc tcc agc aca gcc tac atg cag ctc agc agc ctg aca tct 338
 Asp Ile Ser Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser
 95 100 105

gag gac tct gcg gtc tac tat tgt gca aga ggg ggt tac gac gga tgg 386
 Glu Asp Ser Ala Val Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp
 110 115 120

gac tat gct att gac tac tgg ggt caa ggc aca tca gtc acc 428
 Asp Tyr Ala Ile Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr
 125 130 135

<210> 4
 <211> 137
 <212> PRT
 <213> Unknown

<220>
 <223> Mouse

<400> 4
 Met Gly Trp Ser Tyr Ile Ile Phe Phe Leu Val Ser Thr Ala Thr Ser
 1 5 10 15
 Val His Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys
 20 25 30
 Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe
 35 40 45
 Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu
 50 55 60
 Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn
 65 70 75 80
 Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser
 85 90 95
 Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val
 100 105 110
 Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp
 115 120 125
 Tyr Trp Gly Gln Gly Thr Ser Val Thr
 130 135

<210> 5
 <211> 535
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Mouse consensus sequence

<221> CDS
 <222> (16)...(435)

<400> 5
 cgattactag tcgac atg aag ttg cct gtt agg ctg ttg gtg ctt ctg ttg 51
 Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu Leu
 1 5 10

ttc tgg att cct gtt tcc gga ggt gat gtt gtg gtg act caa act cca 99
 Phe Trp Ile Pro Val Ser Gly Gly Asp Val Val Val Thr Gln Thr Pro
 15 20 25

ctc tcc ctg cct gtc agc ttt gga gat caa gtt tct atc tct tgc agg 147
 Leu Ser Leu Pro Val Ser Phe Gly Asp Gln Val Ser Ile Ser Cys Arg
 30 35 40

tct agt cag agt ctt gca aag agt tat ggg aac acc tat ttg tct tgg 195
 Ser Ser Gln Ser Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp
 45 50 55 60

tac ctg cac aag cct ggc cag tct cca cag ctc ctc atc tat ggg att 243
 Tyr Leu His Lys Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile
 65 70 75

tcc aac aga ttt tct ggg gtg cca gac agg ttc agt ggc agt ggt tca 291
 Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser
 80 85 90

ggg aca gat ttc aca ctc aag atc agc aca ata aag cct gag gac ttg 339
 Gly Thr Asp Phe Thr Leu Lys Ile Ser Thr Ile Lys Pro Glu Asp Leu
 95 100 105

gga atg tat tac tgc tta caa ggt aca cat cag ccg tac acg ttc gga 387
 Gly Met Tyr Tyr Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly
 110 115 120

ggg ggg acc aag ctg gaa ata aaa cgg gct gat gct gca cca act gta 435
 Gly Gly Thr Lys Leu Glu Ile Lys Arg Ala Asp Ala Ala Pro Thr Val
 125 130 135 140

tccatcttcc caccatccag taagcttggg aatccatatg actagtagat cctctagagt 495
 cgacctgcag gcatgcaagc ttccctatatg tgagtcgtat 535

<210> 6
 <211> 140
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Mouse consensus sequence

<400> 6

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Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu Leu Phe Trp Ile Pro
 1           5           10           15
Val Ser Gly Gly Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu Pro
           20           25           30
Val Ser Phe Gly Asp Gln Val Ser Ile Ser Cys Arg Ser Ser Gln Ser
           35           40           45
Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu His Lys
           50           55           60
Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe
65           70           75           80
Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
           85           90           95
Thr Leu Lys Ile Ser Thr Ile Lys Pro Glu Asp Leu Gly Met Tyr Tyr
           100          105          110
Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly Gly Gly Thr Lys
           115          120          125
Leu Glu Ile Lys Arg Ala Asp Ala Ala Pro Thr Val
           130          135          140

```

<210> 7

<211> 112

<212> PRT

<213> Unknown

<220>

<223> Mouse

<400> 7

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Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Phe Gly
 1           5           10           15
Asp Gln Val Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Ala Lys Ser
           20           25           30
Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu His Lys Pro Gly Gln Ser
           35           40           45
Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe Ser Gly Val Pro
           50           55           60
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65           70           75           80
Ser Thr Ile Lys Pro Glu Asp Leu Gly Met Tyr Tyr Cys Leu Gln Gly
           85           90           95
Thr His Gln Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
           100          105          110

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<210> 8

<211> 112

<212> PRT

<213> Homo sapiens

<400> 8

```

Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly
 1           5           10           15
Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser
           20           25           30
Asn Gly Tyr Asn Tyr Leu Asp Trp Tyr Leu Gln Lys Pro Gly Gln Ser
           35           40           45

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Pro Gln Leu Leu Ile Tyr Leu Gly Ser Asn Arg Ala Ser Gly Val Pro
50 55 60
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65 70 75 80
Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Met Gln Ala
85 90 95
Leu Gln Thr Pro Gln Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105 110

<210> 9
<211> 121
<212> PRT
<213> Unknown

<220>
<223> Mouse

<400> 9
Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Thr
1 5 10 15
Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe Thr Ser Tyr
20 25 30
Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45
Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn Gln Lys Phe
50 55 60
Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser Thr Ala Tyr
65 70 75 80
Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp Tyr Trp Gly
100 105 110
Gln Gly Thr Ser Val Thr Val Ser Ser
115 120

<210> 10
<211> 119
<212> PRT
<213> Homo sapiens

<400> 10
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20 25 30
Ala Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu Glu Trp Met
35 40 45
Gly Trp Ile Asn Ala Gly Asn Gly Asn Thr Lys Tyr Ser Gln Lys Phe
50 55 60
Gln Gly Arg Val Thr Ile Thr Arg Asp Thr Ser Ala Ser Thr Ala Tyr
65 70 75 80
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Gly Gly Tyr Tyr Gly Ser Gly Ser Asn Tyr Trp Gly Gln Gly
100 105 110
Thr Leu Val Thr Val Ser Ser
115

<210> 11
 <211> 396
 <212> DNA
 <213> Unknown

<220>
 <223> Mouse

<221> CDS
 <222> (1)...(396)

<400> 11
 atg aag ttg cct gtt agg ctg ttg gtg ctt ctg ttg ttc tgg att cct 48
 Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu Leu Phe Trp Ile Pro
 1 5 10 15
 gtt tcc gga ggt gat gtt gtg gtg act caa act cca ctc tcc ctg cct 96
 Val Ser Gly Gly Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu Pro
 20 25 30
 gtc agc ttt gga gat caa gtt tct atc tct tgc agg tct agt cag agt 144
 Val Ser Phe Gly Asp Gln Val Ser Ile Ser Cys Arg Ser Ser Gln Ser
 35 40 45
 ctt gca aag agt tat ggg aac acc tat ttg tct tgg tac ctg cac aag 192
 Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu His Lys
 50 55 60
 cct ggc cag tct cca cag ctg ctg atc tat ggg att tcc aac aga ttt 240
 Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe
 65 70 75 80
 tct ggg gtg cca gac agg ttc agt ggc agt ggt tca ggg aca gat ttc 288
 Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
 85 90 95
 aca ctg aag atc agc aca ata aag cct gag gac ttg gga atg tat tac 336
 Thr Leu Lys Ile Ser Thr Ile Lys Pro Glu Asp Leu Gly Met Tyr Tyr
 100 105 110
 tgc tta caa ggt aca cat cag ccg tac acg ttc gga ggg ggg acc aag 384
 Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly Gly Gly Thr Lys
 115 120 125
 ctg gaa ata aaa 396
 Leu Glu Ile Lys
 130

<210> 12
 <211> 132
 <212> PRT
 <213> Unknown

<220>
 <223> Mouse

<400> 12

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Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu Leu Phe Trp Ile Pro
 1           5           10           15
Val Ser Gly Gly Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu Pro
          20           25           30
Val Ser Phe Gly Asp Gln Val Ser Ile Ser Cys Arg Ser Ser Gln Ser
          35           40           45
Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu His Lys
          50           55           60
Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe
65           70           75           80
Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
          85           90           95
Thr Leu Lys Ile Ser Thr Ile Lys Pro Glu Asp Leu Gly Met Tyr Tyr
          100          105          110
Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly Gly Gly Thr Lys
          115          120          125
Leu Glu Ile Lys
          130

```

```

<210> 13
<211> 336
<212> DNA
<213> Homo sapiens

```

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<400> 13
gatattgtga tgactcagtc tccactctcc ctgcccgtca cccctggaga gccggcctcc 60
atctcctgca ggtctagtca gagcctcctc catagtaatg gatcaaaacta tttggattgg 120
tacctgcaga agccagggca gtctccacag ctctgatct atttgggttc taatcgggcc 180
tccgggggtcc ctgacaggtt cagtggcagt ggatcaggca cagattttac actgaaaatc 240
agcagagtgg aggctgagga tggtgggggtt tattactgca tgcaagctct accaactcct 300
cagacgttcg gccaaaggac caaggtggaa atcaaa 336

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```

<210> 14
<211> 420
<212> DNA
<213> Artificial Sequence

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<220>
<223> Mouse Act-1 antibody heavy chain variable region
      with a signal peptide sequence

```

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<221> CDS
<222> (1)...(420)

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<400> 14
atg gga tgg agc tgt atc atc ctc ttc ttg gta tca aca gct aca agt 48
Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ser Thr Ala Thr Ser
 1           5           10           15

gtc cac tcc cag gtc caa ctg cag cag cct ggg gct gag ctt gtg aag 96
Val His Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys
          20           25           30

cct ggg act tca gtg aag ctg tcc tgc aag ggt tat ggc tac acc ttc 144
Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe
          35           40           45

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acc agc tac tgg atg cac tgg gtg aag cag agg cct gga caa ggc ctt 192
Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu
50 55 60

gag tgg atc gga gag att gat cct tct gag agt aat act aac tac aat 240
Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn
65 70 75 80

caa aaa ttc aag ggc aag gcc aca ttg act gta gac att tcc tcc agc 288
Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser
85 90 95

aca gcc tac atg cag ctc agc agc ctg aca tct gag gac tct gcg gtc 336
Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val
100 105 110

tac tat tgt gca aga ggg ggt tac gac gga tgg gac tat gct att gac 384
Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp
115 120 125

tac tgg ggt caa ggc acc tca gtc acc gtc tcc tca 420
Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
130 135 140

<210> 15

<211> 140

<212> PRT

<213> Artificial Sequence

<220>

<223> Mouse Act-1 antibody heavy chain variable region
with a signal peptide sequence

<400> 15

Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ser Thr Ala Thr Ser
1 5 10 15
Val His Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys
20 25 30
Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe
35 40 45
Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu
50 55 60
Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn
65 70 75 80
Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser
85 90 95
Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val
100 105 110
Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp
115 120 125
Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
130 135 140

<210> 16

<211> 414

<212> DNA

<213> Artificial Sequence

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<220>

<223> Human 21/28'CL antibody heavy chain variable
region with a signal peptide sequence

<221> CDS

<222> (1)...(414)

<400> 16

atg	gag	ttt	ggg	ctg	agc	tgg	ctt	ttt	ctt	gtg	gct	att	tta	aaa	ggg	48
Met	Glu	Phe	Gly	Leu	Ser	Trp	Leu	Phe	Leu	Val	Ala	Ile	Leu	Lys	Gly	
1				5					10					15		

gtc	cag	tgt	cag	gtg	cag	ctt	gtg	cag	tct	ggg	gct	gag	gtg	aag	aag	96
Val	Gln	Cys	Gln	Val	Gln	Leu	Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys	
			20					25					30			

cct	ggg	gcc	tca	gtg	aag	ggt	tcc	tgc	aag	gct	tct	gga	tac	acc	ttc	144
Pro	Gly	Ala	Ser	Val	Lys	Val	Ser	Cys	Lys	Ala	Ser	Gly	Tyr	Thr	Phe	
		35					40					45				

act	agc	tat	gct	atg	cat	tgg	gtg	cgc	cag	gcc	ccc	gga	caa	agg	ctt	192
Thr	Ser	Tyr	Ala	Met	His	Trp	Val	Arg	Gln	Ala	Pro	Gly	Gln	Arg	Leu	
	50					55				60						

gag	tgg	atg	gga	tgg	atc	aac	gct	ggc	aat	ggt	aac	aca	aaa	tat	tca	240
Glu	Trp	Met	Gly	Trp	Ile	Asn	Ala	Gly	Asn	Gly	Asn	Thr	Lys	Tyr	Ser	
65				70				75						80		

cag	aag	ttc	cag	ggc	aga	gtc	acc	att	acc	agg	gac	aca	tcc	gcg	agc	288
Gln	Lys	Phe	Gln	Gly	Arg	Val	Thr	Ile	Thr	Arg	Asp	Thr	Ser	Ala	Ser	
			85					90						95		

aca	gcc	tac	atg	gag	ctg	agc	agc	ctg	aga	tct	gaa	gac	acg	gct	gtg	336
Thr	Ala	Tyr	Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Val	
			100					105					110			

tat	tac	tgt	gcg	aga	gga	ggt	tac	tat	ggt	tcg	ggg	agc	aac	tac	tgg	384
Tyr	Tyr	Cys	Ala	Arg	Gly	Gly	Tyr	Tyr	Gly	Ser	Gly	Ser	Asn	Tyr	Trp	
		115				120					125					

ggc	cag	gga	acc	ctg	gtc	acc	gtc	tcc	tca							414
Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser							
	130					135										

<210> 17

<211> 138

<212> PRT

<213> Artificial Sequence

<220>

<223> Human 21/28'CL antibody heavy chain variable
region with a signal peptide sequence

<400> 17

Met	Glu	Phe	Gly	Leu	Ser	Trp	Leu	Phe	Leu	Val	Ala	Ile	Leu	Lys	Gly	
1				5				10						15		
Val	Gln	Cys	Gln	Val	Gln	Leu	Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys	
			20					25					30			

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Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe
   35           40           45
Thr Ser Tyr Ala Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu
   50           55           60
Glu Trp Met Gly Trp Ile Asn Ala Gly Asn Gly Asn Thr Lys Tyr Ser
   65           70           75           80
Gln Lys Phe Gln Gly Arg Val Thr Ile Thr Arg Asp Thr Ser Ala Ser
           85           90           95
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val
           100          105          110
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Gly Ser Gly Ser Asn Tyr Trp
           115          120          125
Gly Gln Gly Thr Leu Val Thr Val Ser Ser
   130           135

```

<210> 18
 <211> 540
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Portion of humanized Act-1 antibody heavy chain
 with a heavy chain signal peptide sequence

<221> CDS
 <222> (1)...(540)

```

<400> 18
atg aaa tgc acc tgg gtc att ctc ttc ttg gta tca aca gct aca agt 48
Met Lys Cys Thr Trp Val Ile Leu Phe Leu Val Ser Thr Ala Thr Ser
   1           5           10           15

gtc cac tcc cag gtc caa cta gtg cag tct ggg gct gag gtt aag aag 96
Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys
           20           25           30

cct ggg gct tca gtg aag gtg tcc tgc aag ggt tct ggc tac acc ttc 144
Pro Gly Ala Ser Val Lys Val Ser Cys Lys Gly Ser Gly Tyr Thr Phe
           35           40           45

acc agc tac tgg atg cat tgg gtg agg cag gcg cct ggc caa cgt cta 192
Thr Ser Tyr Trp Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu
           50           55           60

gag tgg atc gga gag att gat cct tct gag agt aat act aac tac aat 240
Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn
   65           70           75           80

caa aaa ttc aag gga cgc gtc aca ttg act gta gac att tcc gct agc 288
Gln Lys Phe Lys Gly Arg Val Thr Leu Thr Val Asp Ile Ser Ala Ser
           85           90           95

aca gcc tac atg gag ctc agc agc ctg aga tct gag gac act gcg gtc 336
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val
           100          105          110

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tac tat tgt gca aga ggg ggt tac gac gga tgg gac tat gct att gac 384
Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp
115 120 125

tac tgg ggt caa ggc acc ctg gtc acc gtc tcc tca gcc tcc acc aag 432
Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys
130 135 140

ggc cca tcg gtc ttc ccc ctg gca ccc tcc tcc aag agc acc tct ggg 480
Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly
145 150 155 160

ggc aca gcg gcc ctg ggc tgc ctg gtc aag gac tac ttc ccc gaa ccg 528
Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
165 170 175

gtg acg gtg tcg 540
Val Thr Val Ser
180

<210> 19

<211> 180

<212> PRT

<213> Artificial Sequence

<220>

<223> Portion of humanized Act-1 antibody heavy chain
with a heavy chain signal peptide sequence

<400> 19

Met Lys Cys Thr Trp Val Ile Leu Phe Leu Val Ser Thr Ala Thr Ser
1 5 10 15
Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys
20 25 30
Pro Gly Ala Ser Val Lys Val Ser Cys Lys Gly Ser Gly Tyr Thr Phe
35 40 45
Thr Ser Tyr Trp Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu
50 55 60
Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn
65 70 75 80
Gln Lys Phe Lys Gly Arg Val Thr Leu Thr Val Asp Ile Ser Ala Ser
85 90 95
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val
100 105 110
Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp
115 120 125
Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys
130 135 140
Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly
145 150 155 160
Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
165 170 175
Val Thr Val Ser
180

<210> 20

<211> 413

<212> DNA

<213> Artificial Sequence

<220>

<223> Portion of humanized Act-1 antibody light chain
with a light chain signal peptide sequence

<400> 20

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atgaagttgc ctgtaggct gttggtgctt ctgttgttct ggattcctgt ttccggaggt 60
gatgttggtga tgactcaaag tccactctcc ctgcctgtca cccctggaga accagcttct 120
atctcttgca ggtctagtca gagtcttgca aagagttatg ggaacaccta tttgtcttgg 180
tacctgcaga agcctggcca gtctccacag ctctcatct atgggatttc caacagattt 240
tctggggtgc cagacaggtt cagtggcagt ggttcaggga cagatttcac actcaagatc 300
tcgcgagtag aggtcagga cgtgggagtg tattactgct tacaaggtag acatcagccg 360
tacacgttcg gacaggggac caaggtggaa ataaaacggg ctgatgcggc gcc 413

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<210> 21

<211> 138

<212> PRT

<213> Artificial Sequence

<220>

<223> Portion of humanized Act-1 antibody light chain
with a light chain signal peptide sequence

<400> 21

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Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu Leu Phe Trp Ile Pro
 1           5           10           15
Val Ser Gly Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro
          20          25          30
Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser
          35          40          45
Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu Gln Lys
          50          55          60
Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe
65          70          75          80
Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
          85          90          95
Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr
          100          105          110
Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly Gln Gly Thr Lys
          115          120          125
Val Glu Ile Lys Arg Ala Asp Ala Ala Pro
          130          135

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<210> 22

<211> 94

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 22

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tttccggagg tgatgttgat atgactcaaa gtccactctc cctgcctgtc acccctggag 60
aaccagcttc tatctcttgc aggtctagtc agag 94

```

<210> 23

<211> 94
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 23
 actggccagg cttctgcagg taccaagaca aataggtgtt cccataactc ttgcaagac 60
 tctgactaga cctgcaagag atagaagctg gttc 94

<210> 24
 <211> 83
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 24
 cctggccagt ctccacagct cctcatctat gggatttcca acagattttc tggggtgcc 60
 gacaggttca gtggcagtgg ttc 83

<210> 25
 <211> 84
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 25
 actcgcgaga tcttgagtgt gaaatctgtc cctgaaccac tgccactgaa cctgtctggc 60
 accccagaaa atctgttgga aatc 84

<210> 26
 <211> 67
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 26
 tctcgcgagt agaggctgag gacgtgggag tgtattactg cttacaaggt acacatcagc 60
 cgtacac 67

<210> 27
 <211> 86
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 27
 atggcgccgc atcagcccgt tttattttcca ccttggtccc ctgtccgaac gtgtacggct 60
 gatgtgtacc ttgtaagcag taatac 86

<210> 28
 <211> 93
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 28
 ataagcttcg ccatgaaatg cacctgggtc attctcttct tggatatcaac agctacaagt 60
 gtccactccc aggtccaact agtgcaccgg tta 93

<210> 29
 <211> 93
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 29
 taaccggtgc actagttgga cctggggagtg gacacttgta gctgttgata ccaagaagag 60
 aatgaccag gtgcatttca tggcgaagct tat 93

<210> 30
 <211> 87
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 30
 caactagtgc agtctggggc tgagggttaag aagcctgggg cttcagtga ggtgtcctgc 60
 aagggttctg gctacacctt caccagc 87

<210> 31
 <211> 88
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 31
 taaccggtac tctagacgtt ggccaggcgc ctgcctcacc caatgcatcc agtagctggt 60
 gaaggtgtag ccagaaccct tgcaggac 88

<210> 32
 <211> 76
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 32
 cgtctagagt ggatcggaga gattgatcct tctgagagta atactaacta caatcaaaaa 60
 ttcaaggac gcgtca 76

<210> 33
 <211> 76
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 33
 taaccggtgt gctagcggaa atgtctacag tcaatgtgac gcgtcccttg aatttttgat 60
 tgtagttagt attact 76

<210> 34
 <211> 88
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 34
 ccgctagcac agcctacatg gagctcagca gcctgagatc tgaggacact gcggtctact 60
 attgtgcaag aggggggttac gacggatg 88

<210> 35
 <211> 88
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 35
 tcaccggtgc ggtgaccagg gtgccttgac cccagtagtc aatagcatag tcccatccgt 60
 cgtaaccccc tcttgacaaa tagtagac 88

<210> 36
 <211> 85
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 36
 ctgggtcaccg tctcctcagc ctccaccaag ggcccatcgg tcttccccct ggcaccctcc 60
 tccaagagca cctctggggg cacag 85

<210> 37
 <211> 85
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 37
 tcaccggttc ggggaagtag tccttgacca ggcagcccag ggccgctgtg cccccagagg 60
 tgctcttggg ggagggtgcc agggg 85

<210> 38
 <211> 10
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 38
 ctggccaacg 10

<210> 39
 <211> 34
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 39
 cacattgact gtagacactt ccgctagcac agcc 34

<210> 40
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 40
 ccggaggtga tggtgtggtg actc 24

<210> 41
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 41
 taagcttccg ccatgggatg gagc 24

<210> 42
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 42
 ggtgacacta gtgccttgac cccag 25

<210> 43
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 43

taagcttccg ccatgaagtt gcct

24

<210> 44

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 44

ggcgccgcat cagcccgttt t

21

<210> 45

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 45

cgcgcccatc tgtcttcac

20

<210> 46

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 46

aagcttctaa cactctcc

18

<210> 47

<211> 19

<212> PRT

<213> Unknown

<220>

<223> Mouse

<400> 47

Asp	Val	Val	Val	Thr	Gln	Thr	Pro	Leu	Ser	Leu	Pro	Val	Ser	Phe	Asp
1				5				10					15		

Gly Gln Val

<210> 48

<211> 11

<212> PRT

<213> Unknown

<220>

<223> Mouse

<400> 48

Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu

1

5

10

<210> 49

<211> 8

<212> PRT

<213> Unknown

<220>

<223> Mouse

<400> 49

Asp Tyr Ala Ile Asp Tyr Trp Gly

1

5

<210> 50

<211> 113

<212> PRT

<213> Artificial Sequence

<220>

<223> Mouse consensus sequence

<400> 50

Asp Val Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly

1

5

10

15

Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His Ser

20

25

30

Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser

35

40

45

Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro

50

55

60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile

65

70

75

80

Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly

85

90

95

Thr His Val Pro Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile

100

105

110

Lys

<210> 51

<211> 114

<212> PRT

<213> Artificial Sequence

<220>

<223> Human consensus sequence

<221> UNSURE

<222> (33)...(33)

<223> Xaa = Any Amino Acid

<221> UNSURE
 <222> (100)...(100)
 <223> Xaa = Any Amino Acid

<221> UNSURE
 <222> (103)...(103)
 <223> Xaa = Any Amino Acid

<400> 51
 Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly
 1 5 10 15
 Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser
 20 25 30
 Xaa Asp Gly Asn Asn Tyr Leu Asn Trp Tyr Leu Gln Lys Pro Gly Gln
 35 40 45
 Ser Pro Gln Leu Leu Ile Tyr Leu Val Ser Asn Arg Ala Ser Gly Val
 50 55 60
 Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys
 65 70 75 80
 Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Met Gln
 85 90 95
 Ala Leu Gln Xaa Pro Arg Xaa Thr Phe Gly Gln Gly Thr Lys Val Glu
 100 105 110
 Ile Lys

<210> 52
 <211> 112
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Reshaped humanized sequence

<400> 52
 Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly
 1 5 10 15
 Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Ala Lys Ser
 20 25 30
 Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu Gln Lys Pro Gly Gln Ser
 35 40 45
 Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe Ser Gly Val Pro
 50 55 60
 Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
 65 70 75 80
 Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Leu Gln Gly
 85 90 95
 Thr His Gln Pro Tyr Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
 100 105 110

<210> 53
 <211> 127
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Mouse consensus sequence

<221> UNSURE
 <222> (106)...(107)
 <223> Xaa = Any Amino Acid

<221> UNSURE
 <222> (110)...(110)
 <223> Xaa = Any Amino Acid

<400> 53
 Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
 20 25 30
 Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
 35 40 45
 Gly Arg Ile Asp Pro Asn Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe
 50 55 60
 Lys Ser Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr
 65 70 75 80
 Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Tyr Tyr Tyr Gly Gly Ser Ser Xaa Xaa Val Tyr Xaa Tyr Trp
 100 105 110
 Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
 115 120 125

<210> 54
 <211> 129
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Human consensus sequence

<221> UNSURE
 <222> (115)...(115)
 <223> Xaa = Any Amino Acid

<400> 54
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
 20 25 30
 Ala Ile Ser Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
 35 40 45
 Gly Trp Ile Asn Pro Tyr Gly Asn Gly Asp Thr Asn Tyr Ala Gln Lys
 50 55 60
 Phe Gln Gly Arg Val Thr Ile Thr Ala Asp Thr Ser Thr Ser Thr Ala
 65 70 75 80
 Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr
 85 90 95
 Cys Ala Arg Ala Pro Gly Tyr Gly Ser Gly Gly Gly Cys Tyr Arg Gly
 100 105 110
 Asp Tyr Xaa Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser
 115 120 125
 Ser

<210> 55
 <211> 121
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Reshaped humanized sequence

<400> 55
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Gly Ser Gly Tyr Thr Phe Thr Ser Tyr
 20 25 30
 Trp Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu Glu Trp Ile
 35 40 45
 Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn Gln Lys Phe
 50 55 60
 Lys Gly Arg Val Thr Leu Thr Val Asp Ile Ser Ala Ser Thr Ala Tyr
 65 70 75 80
 Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp Tyr Trp Gly
 100 105 110
 Gln Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> 56
 <211> 35
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<221> modified base
 <222> (30)...(30)
 <223> n = I

<400> 56
 cccaagcttc cagggrrccar kggataracn grtgg

35

<210> 57
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 57
 cccaagctta cgaggggggaa gacatttggg aa

32

<210> 58
 <211> 34
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide
 <400> 58
 gggaattcat graatgsasc tgggtywtgc tctt. 34
 <210> 59
 <211> 33
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Synthetic oligonucleotide
 <400> 59
 actagtcgac atgaagwtgt ggbtraactg grt 33
 <210> 60
 <211> 30
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Synthetic oligonucleotide
 <400> 60
 cccaagctta ctggatggtg ggaagatgga 30
 <210> 61
 <211> 39
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Synthetic oligonucleotide
 <400> 61
 actagtcgac atggatttwc argtgcagat twtcagctt 39
 <210> 62
 <211> 32
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Synthetic oligonucleotide
 <400> 62
 ggaagcttcc accatggatt tcggactggc cc 32
 <210> 63
 <211> 27
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> Synthetic oligonucleotide
 <400> 63
 ggactagtgg tttggacgag cctgttg 27

<210> 64
 <211> 396
 <212> DNA
 <213> Unknown

<220>
 <223> Mouse

<400> 64
 ttttatttcc agcttggtcc cccctccgaa cgtgtacggc tgatgtgtac cttgtaagca 60
 gtaatacatt cccaagtcct caggctttat tgtgctgac ttgagtgtga aatctgtccc 120
 tgaaccactg ccaactgaacc tgtctggcac ccagaaaaat ctgttgaaa tcccatagat 180
 gaggagctgt ggagactggc caggcttgtg caggtagcaa gacaaatagg tgttcccata 240
 actctttgca agactctgac tagacctgca agagatagaa acttgatctc caaagctgac 300
 aggcagggag agtggagttt gagtcaccac aacatcacct ccggaaacag gaatccagaa 360
 caacagaagc accaacagcc taacaggcaa cttcat 396

<210> 65
 <211> 336
 <212> DNA
 <213> Homo sapiens

<400> 65
 tttgatttcc accttggtcc cttggccgaa cgtctgagga gttggtagag cttgcatgca 60
 gtaataaacc ccaacatcct cagcctccac tctgctgatt ttctgtgtaa aatctgtgcc 120
 tgatccactg ccaactgaacc tgtcaggac cccggaggcc cgattagaac ccaaatagat 180
 caggagctgt ggagactgcc ctggcttctg caggtagcaa tccaaatagt ttgatccatt 240
 actatggagg aggtctgac tagacctgca ggagatggag gccggctctc caggggtgac 300
 gggcagggag agtggagact gagtcacac aatata 336

<210> 66
 <211> 420
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Mouse Act-1 antibody heavy chain variable region
 with a signal peptide sequence-antisense

<400> 66
 tgaggagacg gtgactgagg tgccttgacc ccagtagtca atagcatagt cccatccgtc 60
 gtaacccctt cttgcacaat agtagaccgc agagtcctca gatgtcaggc tgctgagctg 120
 catgtaggct gtgctggagg aaatgtctac agtcaatgtg gccttgccct tgaatttttg 180
 attgtagtta gtattactct cagaaggatc aatctctccg atccactcaa ggccttgtcc 240
 aggcctctgc ttcacccagt gcatccagta gctgggtgaag gtgtagccat aacccttgca 300
 ggacagcttc actgaagtcc caggcttcac aagctcagcc ccaggctgct gcagttggac 360
 ctgggagtggt acacttgtag ctgttgatac caagaagagg atgatacagc tccatcccat 420

<210> 67
 <211> 414
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Human 21/28'CL antibody heavy chain variable
 region with a signal peptide sequence-antisense

<400> 67

tgaggagacg	gtgaccaggg	ttccctggcc	ccagtagttg	ctccccgaac	catagtaacc	60
tcctctcgca	cagtaataca	cagccgtgtc	ttcagatctc	aggctgctca	gtcccatgta	120
ggctgtgctc	gcggatgtgt	ccctggtaat	ggtgactctg	ccctggaact	tctgtgaata	180
ttttgtgtta	ccattgccag	cgttgatcca	tcccatccac	tcaagccttt	gtccgggggc	240
ctggcgcacc	caatgcatag	catagctagt	gaagggtgtat	ccagaagcct	tgcaggaaac	300
cttcactgag	gccccaggct	tcttcacctc	agccccagac	tgcacaagct	gcacctgaca	360
ctggacacct	tttaaaatag	ccacaagaaa	aagccagctc	agcccaaact	ccat	414
